

REMARKS

Claims 1-58 were presented and stand rejected. Claims 1, 18, 35 and 52 are amended.

Claims 1-58 were rejected under 35 USC §103(a) as being unpatentable over Naito, U.S. Patent No. 6,690,732, in view of Koda, U.S. Patent No. 6,408,030. This rejection is respectfully traversed.

As amended, claim 1 recites (emphasis added):

A computer implemented method of encoding video images, where each image has a frame type, comprising:

receiving a plurality of macroblocks for an uncompressed image;
determining a macroblock type for each macroblock;

determining whether the image represents a scene change based upon a distribution of macroblock types of the macroblocks and the frame type of the image; and

encoding the image without changing the frame type of the image in response to the determination of a scene change and the frame type of the image.

Claims 18, 35 and 52 recite similar language. The method includes determining whether an image to be encoded represents a scene change based upon a distribution of macroblock types of the image and the frame type of the image, and encoding the image without changing the frame type of the image in response to the determination of a scene change and the frame type of the image. The claimed invention beneficially allows an encoding system to perform scene change detection of an image during the encoding process, without first decoding the compressed image prior in order to identify the scene change.

Naito does not disclose the claimed invention. Specifically, Naito does not disclose determining whether the image represents a scene change based upon a distribution of

macroblock types of the macroblocks and the frame type, and encoding the image without changing the frame type of the image in response to the determination of a scene change and the frame type of the image. Naito discloses an apparatus for minimizing the degradation of picture quality derived from the point of scene change (Abstract). When the point of scene change is detected, the number of bits allocated to the input video signal is weighted by the distance between the input video signal and the point of scene change and the encoding difficulty (Abstract and 3:50-60).

The Examiner stated that Naito discloses the claimed scene change detection at column 1, lines 7-10. However, column 1, lines 7-10 of Naito merely describes the “field of the invention” of Naito, i.e., an encoding apparatus capable of minimizing the degradation of picture quality derived from a scene change. Obviously, this generic statement cannot and does not disclose or suggest the claimed scene detection based upon a distribution of macroblock types of the macroblocks and the frame type.

Indeed a close reading of Naito shows that in fact he does not disclose any specific way to detect scene changes, only saying “the spatiotemporal filter 4 receives the scene attribute data (a) (Step S1) and when finding a scene change point from the scene attribute data (a) (i.e. it is judged "yes" at Step S2), calls the encoding difficulty data (b) (Step S3).” (2:39-43). Naito’s failure to provide any specific disclosure of how to perform scene change detection is not surprising since Naito expressly states that the scene change detector “may be implemented by known components” (2:27-29). Thus, given that Naito does not disclose any specific way to detect scenes, Naito simply cannot disclose or suggest “determining whether the image represents a scene change based upon a distribution of macroblock types of the macroblocks and the frame type of the image” as claimed.

Further, Naito does not disclose “encoding the image ... in response to the determination of a scene change and the frame type of the image” because Naito does not encode the image using frame type information of the image. The Examiner cited column 3, lines 50-59 of Naito as allegedly disclosing the claimed feature. However, column 3, lines 50-59 merely describes a benefit of the scene change detection in terms of bit allocation to the frame just after the point of scene change in that the frame is slightly higher in the picture quality than the previous frames. To encode the input video signal, Naito calculates the target encoding data amount T by the product $T \times W_{sc}$, where W_{sc} depends the distance between the input video signal and the point of scene change, regardless of the frame type of the input video signal (3:27-35). There is simply no disclosure here that Naito makes any use of “frame type” when encoding. Thus, Naito does not disclose or suggest the claimed invention.

Koda does not remedy the deficiencies associated with Naito. The Examiner admitted that Naito’s apparatus lacks determining the macroblock type and the distribution of macroblock types and stated that these features are disclosed in Koda. However, Koda does not disclose the claimed features. Koda discloses a method for detecting a scene change point in a moving picture that requires first decoding an image which has already been coded (Abstract).

Koda does not disclose determining whether an image represents a scene change based on a distribution of macroblock types of the image and the frame type of the image during encoding process. Rather, Koda detects a scene change point for a specific picture type during decoding process using a block count which is a sum of the number of blocks completing intra-picture compression, the number of blocks completing differential-picture compression and the number of skipped blocks (FIG. 8 and 8:39:61). To use the block count, Koda has to decode user data which includes the block count and uses the decoded user data to detect a scene change

point (8:32-62). In contrast, the claimed invention uses the distribution of the macroblock types and the frame type to detect the scene change point during encoding process. As such, Koda does not disclose the claimed invention.

The combination of Naito and Koda does not teach or disclose the claimed features. As described above, Naito does not disclose a scene change detector based upon a distribution of macroblock types of the macroblocks and the frame type as claimed. Further, Naito's encoding requires detecting a point of scene change during encoding process, stating "as the point of scene change and the encoding difficulty are determined prior to the encoding process" (3:50-52). By contrast, Koda's scene detection is performed during decoding, as admitted by the Examiner. As such the combination of Naito and Koda is improper since the combination changes the principle of operation of at least one of these references, given their entirely opposite approaches. See, MPEP 2143.01, Section VI ("If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims prima facie obvious.").

For at least the reasons above, the Applicants submit that claims 1, 18, 35 and 52 are patentable over the cited references. Claims 2-17, 19-34, 36-51 and 53-58 either directly or indirectly depend from claims 1, 18, 35 and 52. These dependent claims also recite additional features not disclosed by the cited references. Thus, the Applicants submit claims 2-17, 19-34, 36-51 and 53-58 are patentably distinguishable over the cited references.

In sum, the Applicants respectfully submit that pending claims are patentably distinguishable over the cited references. Therefore, the Applicants request reconsideration of the basis for the rejections to these claims and request allowance of them.

If the Examiner is in need to further information, he is invited to contact the undersigned agent at the telephone number provided below.

Respectfully submitted,
VIKRANT KASARABADA, ET AL.

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By: /Fengling Li/
Fengling Li, Reg. No. 62,962
Patent Agent
Fenwick & West LLP
Silicon Valley Center
801 California Street
Mountain View, CA 94041
Tel. (650) 335-7182
Fax (650) 938-5200